IDEA-0657-68
Copy 9 of 10

3 September 1968

MEMORANDUM FOR THE RECORD

SUBJECT: U-2R Demonstrated Maximum Altitude Profile

1. On 16 August 1968 flight number 23 of U-2R Aircraft Number 055 was flown for the purpose of demonstrating the design weight maximum power cruise performance using a detachment aircraft. The pilot was [redacted] LAC. A summary of the results of the flight compared to the model specification performance of SP-1125 is noted in the following table:

25X1A

25X1A

	S/N 055 FLT 23	MODEL SPEC SP-1125
T.O. Gross Wt. - Lbs.		
Zero Fuel Weight - Lbs.		
Range to Begin Descent - N.M.		
Altitude at Begin Descent - Ft.		
Flight Time to Descent - Hrs.		
Cruise Mach Number		
Cruise Free Air Temp - $-^{o}C$		
Fuel Remaining at Begin Descent - Gal.		

2. Correcting the flight data to a standard day temperature of $-56.5^{o}C$ and extrapolating the performance to a fuel remaining of 108 gallons at begin descent, the performance comparison follows:

	S/N 055 FLT 23	MODEL SPEC SP-1125
Range to Begin Descent - N.M.		
Altitude at Begin Descent - Ft.		

25X1A

25X1

3. The demonstrated cruise range factors exceeded the estimated specification range factors throughout the entire flight by variations of 1% - 3%. As noted in paragraph 2 above, by correcting for temperature effects and for differences in fuel remaining at start descent, the flight performance was 1100 feet below the specification performance. Deficiencies of 800 - 1100 feet were noted throughout the flight. LAC attributes this reduction in altitude to an engine thrust deficiency throughout the cruise portion of the flight. This thrust deficiency is derived from the lower than predicted values of engine pressure ratio (EPR) observed during flight for the exhaust gas temperature (EGT) of 665°C. Since thrust is a direct function of EPR for a given value of EGT and altitude, the observed EPR's were converted to thrust values and these values of thrust when compared to thrust estimated from specification EPR's and altitude at EGT = 665°C reflected a 4% - 5% thrust deficiency. However, ASD/R&D estimates an altitude loss of approximately 140 feet for each percent thrust loss and does not believe that the entire altitude loss of 1100 feet is due to a thrust deficiency.

/s/
[redacted]
ASD/R&D/OSA

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25X1A ASD/R&D/OSA [redacted] anw/3 Sept 68

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